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To: Robin Kinser

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From: Kathy Mitchell

Subject: Literature Search: Half Life of Cadmium in Blood

Files Searched: Medline (Dialog File 155) 1966 - 10/2000

Many factors affect the burden of cadmium in the circulatory system including the route, duration and concentration of metal exposure, the deposition in tissues, excretion rates and the binding to metallothionein. Cadmium can be found in plasma and erythrocytes.

The library collection was reviewed for books on the biological fate of cadmium in humans (Attachment 1).

One of the most indepth sources in our collection is Cadmium and health : a toxicological and epidemiological appraisal. (Friberg, Lars et. al., editors Boca Raton, Fla. : CRC Press, 1985) Friberg devotes a chapter (Chapter 2 Principles and Problems of Cadmium Analysis) to the difficulties in evaluating published reports. Kinetics and Metabolism is reviewed in Chapter 6. A fast component half time of several months; and a slow component half time of 7 to 16 years and a fast component half time of 75-130 days was reported by two researchers (page 131).

In Trace elements in health and disease. (Aitio, Antero et. al., editors. Cambridge : Royal Society of Chemistry, 1991) Braithwaite has authored "Cadmium Toxicokinetics following Long-term Occupational Exposure" (page 95-103).

In Cadmium In The Human Environment: Toxicity And Carcinogenicity Lyon, France IARC 1992 (Volume 118) several chapters are dedicated to metabolism and toxicology. Human studies reporting the exposure, retention, and elimination were reviewed. No report of elimination half-life in blood was found.

In The Chemistry, biochemistry, and biology of cadmium. (Webb, M., editor. New York : Elsevier/North Holland Biomedical Press, 1979) cadmium in blood is reviewed in chapters contributed by Ian Bremner (Chapter 5 Mammalian absorption, transport and excretion of cadmium) and Samarawickrama (Chapter 9 Biologic Effects of cadmium in mammals).

In Toxicology of metals : biochemical aspects (Goyer, R. A and M. George Cherian, Editors, New York : Springer-Verlag, c1995) one chapter authored by Goering (Chapter 9 Toxicity of Cadmium) cites references in the section on metabolism pointing out that the clearance of cadmium from the circulatory system is rapid and results in deposition in tissues. Goering refers to Goyer (Toxic Effects of Metals. In: Amdur MO, Doull, J, Klassen CD, eds. Casarett and Doull's toxicology, the basic science of poisons. 4th edn. McGraw-Hill Pergamon, New York, pp 634-638) in stating that the half life of cadmium in humans is 10-30 years. In Chapter 6 (Metallothionein and its Interaction with Metals) authored by Cherian, metallothionein's role as a metal storage protein is discussed.

In Cadmium toxicity. (Mennear, John, ed. New York : M. Dekker, 1979) Probst contributed a chapter (Chapter 2 Cadmium: Absorption, Distribution, and Excretion in Mammals) with a short section on cadmium in blood and cites a study where plasma and erythrocyte levels were monitored following exposure (Shaikh ZA, Lucas OJ Biological Difference in Cadmium and Zinc Turnover. Arch. Environ. Health 24:410-425 (1972)).

Additionally, the Medline file was searched for articles reporting half life or pharmacokinetics of cadmium in human blood in English. A set of thirty-three matches was retrieved and the bibliographies are attached in Table 2. Titles in bold have been ordered for you.

Two references of interest are attached in Table 3. These were located either as a reference from the IARC monograph or from searching Science Direct (Elsevier electronic journals).

A copy of the bibliographic information for each item is attached. Copies of the complete papers can be ordered in the library.

Attachment